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Simple measure of memory for dynamical processes described by a generalized langevin equation

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Abstract

Memory effects are a key feature in the description of the dynamical systems governed by the generalized Langevin equation, which presents an exact reformulation of the equation of motion. A simple measure for the estimation of memory effects is introduced within the framework of this description. Numerical calculations of the suggested measure and the analysis of memory effects are also applied for various model physical systems as well as for the phenomena of "long time tails" and anomalous diffusion. © 2005 The American Physical Society.

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